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For: PREDICTIVE ALGORITHMIC MODEL

1 1. A predictive algorithmic model for simulating photocatalytic reactions
2 comprising:
3 an input section for defining a plurality of variables;
4 a calculation section for calculating a plurality of intermediate values and a
5 plurality of output values; and
6 an output section for providing the plurality of output values of the
7 photocatalytic reactions.

1 2. The predictive algorithmic model of claim 1 wherein the plurality of
2 variables include material, wavelength and photocatalytic reaction variables.

1 3. The predictive algorithmic model of claim 1 wherein the plurality of
2 variables include at least a first laser wavelength, a base fluence value, a fluence increment
3 value, a first gas partial pressure, a partial pressure increment, a total pressure, first and
4 second reactant types, a material absorption coefficient, a material threshold value, a
5 material refractive index, an angle of incidence, and first and second photochemical reaction
6 parameters.

1 4. The predictive algorithmic model of claim 3 wherein the first laser
2 wavelength is in the range of 100 to 400 nm.

1 5. The predictive algorithmic model of claim 1 wherein the plurality of
2 intermediate values include first and second optical gas densities, an incident fluence
3 absorbed by gas, a reflected fluence, a total fluence absorbed by gas, a fluence absorbed
4 in material, an ablation depth per pulse, and a photochemical component.

1 6. The predictive algorithmic model of claim 1 wherein the plurality of
2 output values includes a total material removed and a removal efficiency.

1 7. The predictive algorithmic model of claim 1 wherein the photocatalytic
2 reactions are ultraviolet catalytic reactions.